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SHACKLEFORD CREEK RESTORATION PROJECT
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Project # 95-JITW-05

A

WATER QUALITY PROJECT

Completed by,

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ABSTRACT: The Shackleford Creek Restoration Project was initiated because some water quality funding was returned to the USFWS from a local tribe. The Funding was earmarked for water quality improvement efforts in the Shackleford Creek sub-watershed, a tributary to the Scott River. The funding was used to expand and improve two restoration projects on Mill Creek, the major tributary to Shackleford Creek. Both projects are on private property which is owned by two proactive property owners. The two projects are contiguous along Mill Creek and extend from the confluence of Emigrant and Mill Creek. to the confluence of Mill and Shackleford Creek.

The focus of both projects is based on habitat protection and enhancement. Both projects are riparian fencing and the establishment of efficient stock watering projects. The funding provided by the Shackleford Creek Restoration Project allowed the RCD to extend the fencing and increase an efficient stock watering project which will increase stream flows in the fall. Both fencing and stock watering systems of the Shackleford Restoration Project provide long term solutions to water quality protection and wise use of water.

BACKGROUND:
The Siskiyou Resource Conservation District (RCD) is a special district run by a board of property owners who are addressing the issues related to resource use within the Scott River watershed. The RCD has focused mainly on the floor of Scott Valley and tributary valleys which have been dominated by agricultural use for over a century. Agriculture within Scott Valley focuses on beef cattle, wheat and alfalfa production. The Siskiyou RCD searches for project designs which conserve the use of resources as well as improve management of property and livestock. This ensures the extension of the project life as the project works for the property owner rather then against them.

The current issue related to resource use revolves around anadromous fisheries and watershed health. The population of anadromous fisheries has generally declined throughout the Pacific Northwest during the past several decades. Academia has found that water quality is one of the limiting factors related to declining salmonid populations. The North Coast Regional Water Quality Control Board (NCRWQCB) has listed the Scott River has having two non-point source water quality impairments: excessive sediment and temperature levels at certain periods of the year. The NCRWQCB feels that insufficient flows have been one of the factors leading to high water temperatures during the late summer and early fall. Increased flows in the fall is a major goal of the Scott River Coordinated Resource Management Plan (CRMP) and the RCD.

Restoration projects within the watershed include riparian fencing, bank stabilization, implementation of fishery habitat improvement structures, replanting the riparian zone and limiting up-slope sediment sources. This "holistic" approach includes practices which reduce high sediment levels and water temperatures within streams used by anadromous fish. It does not, however identify an alternative "off-site" (outside of the stream corridor and riparian zone) source for watering livestock which previously utilized surface flow from a stream or diversion ditch.

The lack of alternate watering sources appeared to be the limiting factor which would reduce the scope of a holistic restoration approach throughout the watershed. If the RCD could provide an off-site watering source, many property owners who own livestock would agree to management changes within riparian zones and/or efficient stock watering strategies on their property

OBJECTIVE: The objective of the Shackleford Creek Restoration Project, which is administered by the USFWS, is to improve water quality in the Shackleford Creek sub-watershed. The funding was returned to the USFWS from the original subcontractor in the fall of 1998. Therefore, the RCD had limited time to utilize the funding once it was actually received. There was no time to utilize the funding and obtain the needed permits and surveys required to "break new ground". For this reason, the RCD decided the best purpose of the funding was to use existing permitted projects and expand and improve them in a fashion which would focus on water quality improvement. The funding provided in the Shackleford Creek Restoration Project fit well in the existing projects which were being implemented.

The project area included both Shackleford Creek and Mill Creek. The primary focus of the two existing projects reached from the confluence of Mill Creek and Emigrant Creek to just below the confluence of Mill Creek and Shackleford Creek. This reach is an extremely important section related to fisheries as the flows in Mill Creek remain fairly constant and cool, even in the summer months. However, grazing practices throughout the reach have damaged the riparian area while upslope activity and historical mining have damaged the channel geometry of the stream. Currently, the stream is dominated by runs and riffles and the channel is braided due to excessive bed load and poor channel definition. The braided channel is wide and shallow. This characteristic of channel geometry is reducing the potential fish habitat and damaging the water quality by creating an unstable channel.

The lack of riparian species along the channel banks allows the channel to move rapidly and posses poor channel characteristics for fish and retaining water quality. The goal of the project is to limit the amount of grazing which occurs in the riparian area and allow riparian species to become established in the protected area (riparian corridor). Once the riparian species have become established, the root systems will constrict the channel width. As the channel width reduces, the depth of the channel will increase and the capacity of the channel to transport sediment increases. As sediment transport increases, channel stability increases and fish habitat improves due to a stable stream pattern, stable stream banks and a deeper low flow channel. This is evident in several locations where proper grazing has occurred and riparian habitat is in good condition. The stream channel is stable and providing excellent fish habitat and protection of water quality related to sediment and temperature. A stable channel improves spawning locations, increases rearing capacity and improves the channels' ability to retain water quality related to temperature and sediment contribution.

PROJECT IMPLEMENTATION: Before any project implementation began, considerable planning took place accessing existing conditions and the attainable goals. This is what we knew: The project area was dominated by a large wide active channel and numerous gravel bars (deposits). The channel geometry was dominated by a braided and wide, shallow channel configuration. There was very little riparian establishment in portions of the project reach while other locations were functioning well. In the poorly functioning areas, livestock had year round access to the stream. We knew that summer flows were cool, yet the flows were fairly minimal due to an aggraded channel and agricultural adjudicated rights. Water quality would improve if we could increase the surface flow of Mill Creek. In order to allow the project area to improve, the RCD knew that two functions had to improve: riparian protection and increased flows.

Fencing: The Shackleford Creek Project allowed the RCD to install 3,600 feet of new fencing along Mill Creek. The specific reach of Mill Creek where the fencing was installed had been available to livestock year round for over twenty years. The riparian species had been reduced to mature cottonwoods and scattered alders and willows.

The fencing was installed to meet NRCS fencing specifications. The placement of the fence allows an approximate average riparian area width of 350 feet. RCD staff observed excellent opportunities for natural riparian regeneration. An abundance of young alder, willow and a few cottonwood were found throughout the newly established riparian area. We expect the riparian area to rebound almost immediately due to excellent seed sources, a high, stable water table and new riparian protection provided by the fencing. The fencing provided by the Shackleford Restoration Project is a portion of a larger fencing program which has installed 1.7 miles of riparian fencing on Mill Creek and .9 miles on Shackleford. The fencing will protect existing riparian areas and provide opportunity for increased riparian establishment.

Efficient Livestock Watering System:

The practice of developing an efficient livestock watering system has been termed the Alternative Livestock Watering System (ALWS) by the RCD and the Scott River CRMP. The ALWS is now the catalyst for development of new restoration programs. A livestock watering system which meets the landowners management needs is a permanent solution to excluding or intensively managing cattle within riparian zones and/or increasing surface flow.

The benefit to water quality is based on the permanent exclusion/intensive management via a grazing plan of livestock in the riparian area. Riparian fencing leads to restoration activities including riparian planting which traps sediment, improves sediment transport, improves width-depth ratio and provides shade. Water quantity is also improved by forming voluntary agreements with diversion users to utilize an ALWS rather then their adjudicated livestock watering right. This allows the diversion user to return the flow to the stream rather then utilize his/her water right.

The Shackleford Restoration Project increased and enhanced an existing stock watering system which will eliminate the use of a 1.4 cfs diversion for the purpose of watering stock. The project purchased needed materials including pipe, plumbing materials, and electrical services for the pump. The funding allowed the RCD to extend the ALWS system across Quartz Valley Road. The extension eliminates the need for any surface flow from the diversion for the purpose of watering livestock. The extension of the watering system provides water to all locations where livestock will be present. Prior to the project extension, a small amount of surface flow from the diversion would have been required to water livestock when grazing on the south side of Quartz Valley Road.

Using a surface flow diversion for watering livestock is very inefficient. Cattle require about 15 gallons of water a day. Assuming a property owner has 200 head of cattle, he/she would need approximately 3,000 gallons of water a day the water the livestock. A one cubic foot per second (cfs) diversion delivers 648,000 gallons of water a day. That is 215 times more than the needed amount to water the livestock.

A typical stock water system uses an existing well as its source of ground water. A small submersible pump is installed in the well casing. The pump size ranges from 3/4 to 1 1/2 horsepower depending on the number of troughs, the distance between pump and troughs and whether or not the system will double as a riparian revegetation irrigation system. The submersible pump is accompanied by a large pressure tank, pressure switch and a pressure sensor. The system is similar in design to the systems installed in homes. The pump system is inside an insulated pump house with a concrete foundation.

Water is transported through schedule 40 PVC pipe ranging in size from 3/4" to 1 1/2" in diameter. Pipe diameter is determined by a sliding scale which takes increase in elevation, length of run and desired flow volume at source into account. Friction draw-down inside the pipe is a major loss of pressure and flow volume over a long distance. The desired diameter of pipe is buried 24"-30" deep in the soil form the water source to the watering trough(s).

Troughs are also supplied by the RCD. The number of troughs and size depends on the number of livestock using the system and the management style related to cost/ benefit. The flow to the troughs is activated by a float valve which conserves water and power by eliminating the need for continuous flow.

CONCLUSION: The Shackleford Creek Restoration Project was actually an extension of two existing projects located on Mill Creek. The Shackleford Restoration Project provided the materials and installation 3,600 feet of fencing as well as the materials for another 2,100 feet of fencing materials for Shackleford Creek. The funding expanded an efficient stock watering project which will increase fall flows and improve water quality. We are confident the expansion of the two existing projects will improve water quality in the Mill/Shackleford Creek drainage.

Riparian fencing along the west side of Mill Creek on Dews property

Mill Creek off of Quartz Valley Road Bridge which now has riparian fencing.

END

10-25-99